

Notice of Allowability

Application No.

10/694,217

Applicant(s)

BAEK, HEUM-IL

Examiner

Art Unit

Timothy L. Rude

2883

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to amendment filed 02 December 2004.
2. ☒ The allowed claim(s) is/are 1-5, 7-12, 29, 30 and 32.
3. ☒ The drawings filed on 28 October 2003 are accepted by the Examiner.
4. ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☒ All b) ☐ Some* c) ☐ None of the:
 1. ☐ Certified copies of the priority documents have been received.
 2. ☒ Certified copies of the priority documents have been received in Application No. 09/850,186.
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
 6. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
 - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
7. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

- | | |
|---|--|
| 1. <input type="checkbox"/> Notice of References Cited (PTO-892) | 5. <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 2. <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 6. <input type="checkbox"/> Interview Summary (PTO-413),
Paper No./Mail Date _____. |
| 3. <input type="checkbox"/> Information Disclosure Statements (PTO-1449 or PTO/SB/08),
Paper No./Mail Date _____ | 7. <input checked="" type="checkbox"/> Examiner's Amendment/Comment |
| 4. <input type="checkbox"/> Examiner's Comment Regarding Requirement for Deposit
of Biological Material | 8. <input checked="" type="checkbox"/> Examiner's Statement of Reasons for Allowance |
| | 9. <input type="checkbox"/> Other _____ |

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DETAILED ACTION

Claims

Claim 6 is canceled. Claims 1, 7, 8, and 29 are amended.

EXAMINER'S AMENDMENT

An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it **MUST** be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Victoria D Hao on 02 March 2005.

The application has been amended to cancel claims drawn to a non-elected species as follows:

Claims 31 and 33 are canceled.

Allowable Subject Matter

Claims 1-5, 7-12, 29, 30, and 32 are allowed.

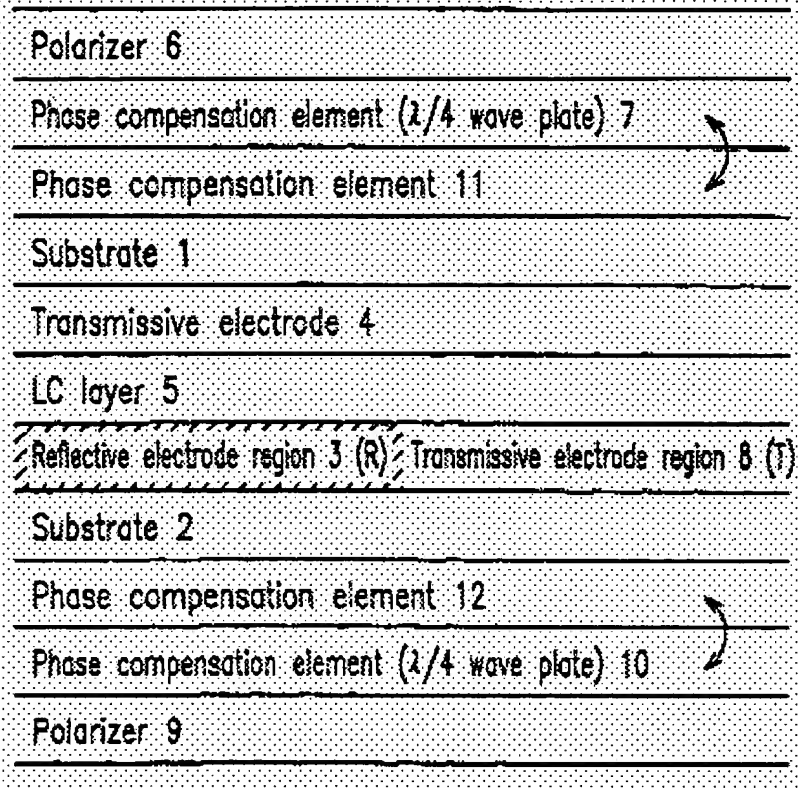
As to claims 1 and 29, relevant prior art of record, either alone or in combination, does not disclose nor render obvious a transflective liquid crystal display as claimed, wherein the first adjusted thickness is $d+d_{\text{sub.1}}$, where d is a normal thickness of the liquid crystal layer and $d_{\text{sub.1}}$ is calculated using the following equation,

$$T = \sin^2 2\phi \sin^2 \left[\frac{\pi \cdot \Delta n \cdot d_{\text{sub.1}}}{\lambda} \right]$$

where T is a value of transmittance when a maximum operation voltage is applied, ϕ is an angle between an optical axis of the liquid crystal layer and a transmissive axis of the polarizer, Δn is a birefringence of the liquid crystal layer.

The closest reference is Kubo who discloses in his description of the preferred embodiments (embodiment 1, col. 8, line 20 through col. 19, line 54, and especially second example, col. 19, line 55 through col. 24, line 55, as shown in Figures 8A and 8B), a transflective display similar to Applicant's species A, [Applicant's Figure 6] which is equivalent in most other regards to Examples 3 (regarding retarders applicable to Example 6) (col. 24, line 56 through col. 29, line 67) and 6 (regarding electrodes and other structure), (col. 47, line 50 through col. 51, line 25) a transmissive and reflective type (Applicant's transflective) (col. 8, lines 37-40) liquid crystal display, comprising:

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FIG. 3

substrate 1 (Applicant's upper) and substrate 2 (Applicant's lower), substrates facing into and spaced apart from each other, wherein the upper and lower substrates include a plurality of pixel regions (region R and region T) that display images;

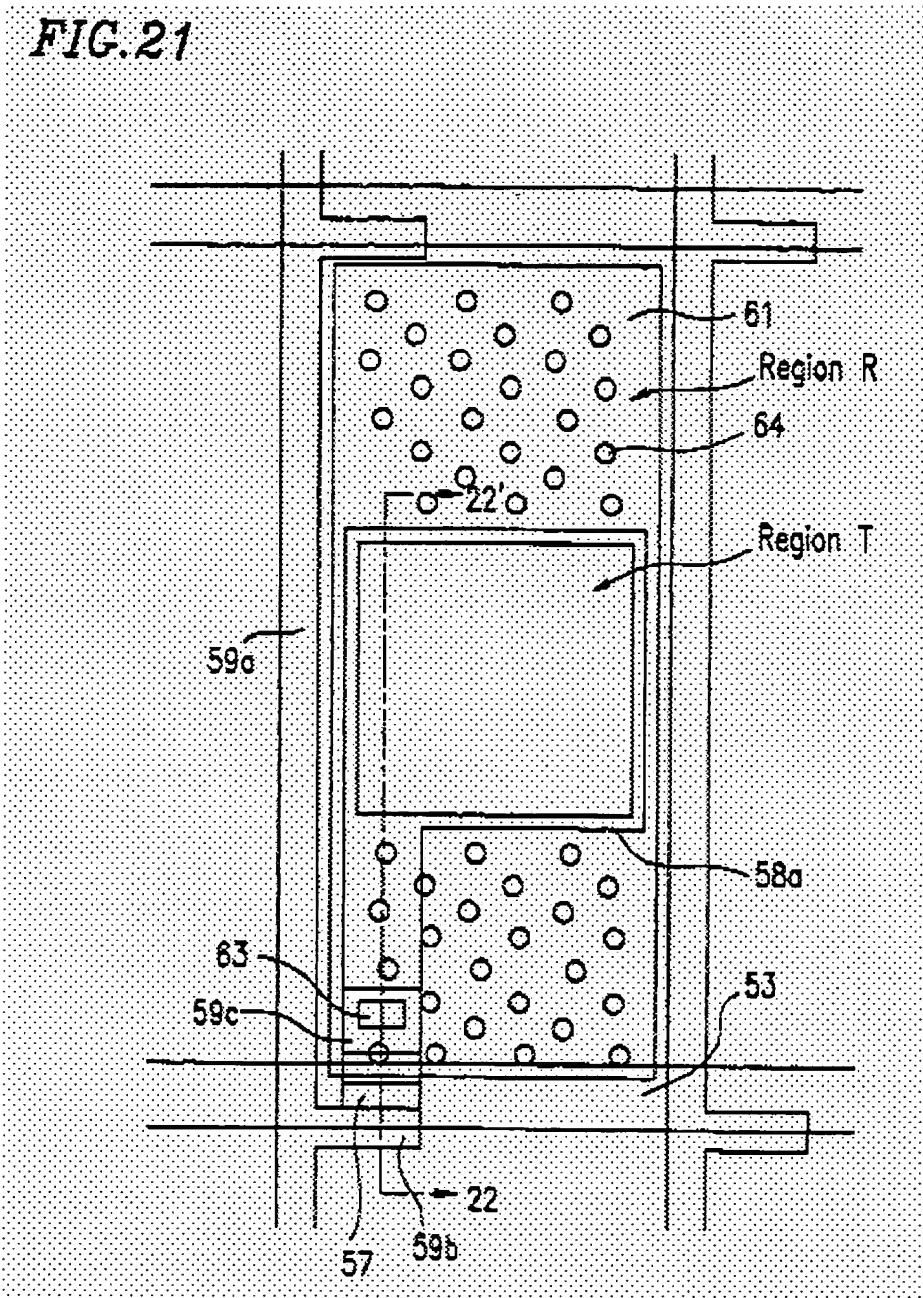


FIG. 8A

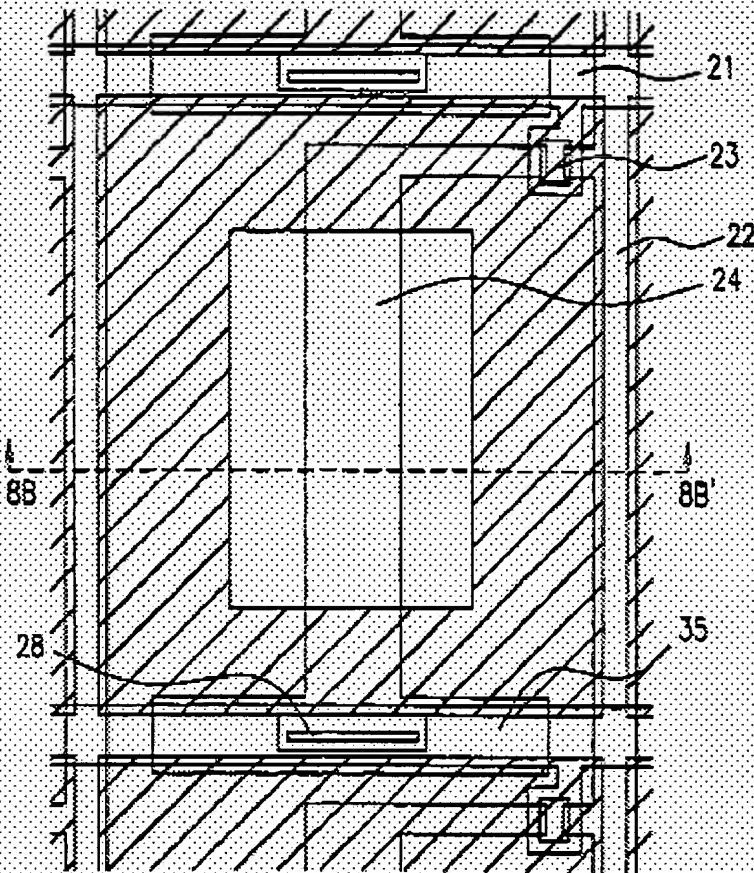
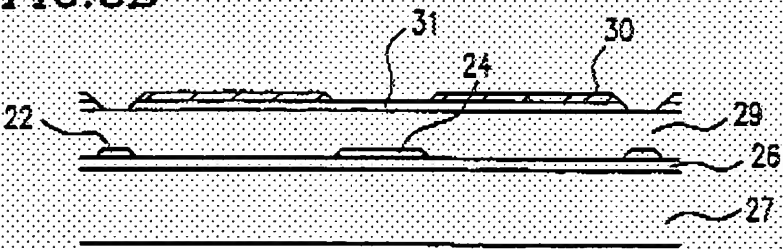
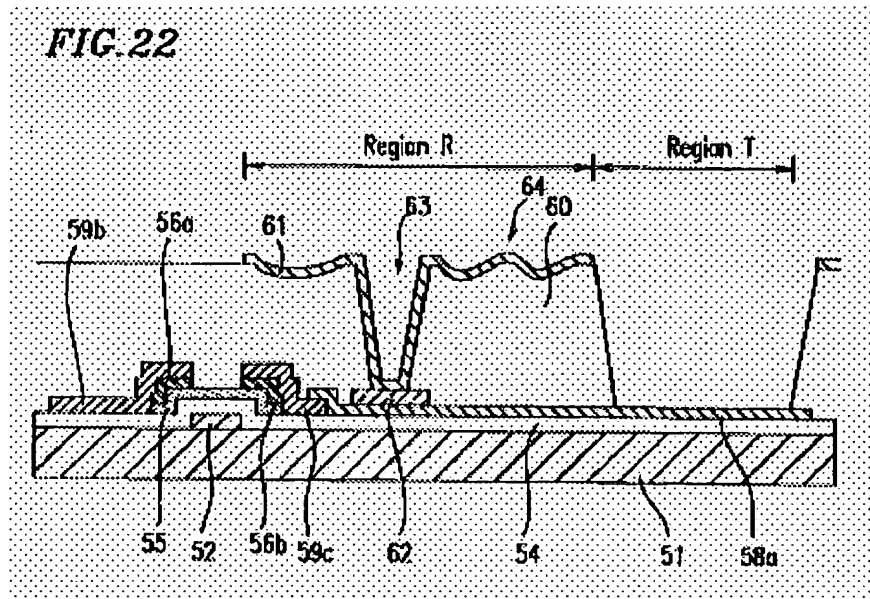


FIG. 8B



Structures in Figures 8A and 8B are largely similar to Figure 22 with exception of the removal of material in Region T:



a liquid crystal layer, 5, interposed between the upper and lower substrates, wherein the liquid crystal layer has a first adjusted thickness (region R) to compensate a residual optical retardation of incident light caused by anchored liquid crystals near an alignment layer when a maximum operation voltage is applied;

a first upper retardation film, 11, over the upper substrate;

a second upper retardation film, 7, between the first upper retardation film (interchangeable as indicated) and the upper substrate, wherein the second upper retardation film has a second adjusted thickness of compensating an optical retardation caused by the liquid crystal layer (col. 28, lines 32-53);

an upper polarizer, 6, on the first upper retardation film;

a transparent common electrode, 4, on a surface of the upper substrate facing into the lower substrate;

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a pixel electrode over the lower substrate, wherein the pixel electrode corresponds to each pixel region, and the pixel electrode is divided into transparent, 58a, and reflective, 61, portions;

a second lower retardation film on the other surface of the lower substrate, wherein the second lower retardation film has a third adjusted thickness to compensate a residual optical retardation caused by the liquid crystal layer when a maximum operation voltage is applied;

a first lower retardation film, 12, under the second lower retardation film, 10, (interchangeable as indicated);

a lower polarizer, 9, under the first lower retardation film; and

a backlight device arranged adjacent to the lower polarizer (col. 13, lines 25-35).

However, Kubo does not teach use of a first adjusted thickness limited as claimed.

As to claim 8, relevant prior art of record, either alone or in combination, does not disclose nor render obvious a transfective liquid crystal display as claimed, wherein the second adjusted thickness of the upper QWP is $d+d_{\text{sub.2}}$, where a normal thickness of the upper QWP is d and $d_{\text{sub.2}}$ is calculated from the following equation,

$$T = \sin^2 2\phi \sin^2 \left[\frac{\pi \cdot \Delta n \cdot d_{\text{sub.2}}}{\lambda} \right],$$

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where T is a value of transmittance, ϕ is an angle between a slow axis of the upper QWP and a transmissive axis of the polarizer, Δn is a birefringence of the upper QWP.

The closest reference is Kubo who discloses the displays as described above. However, Kubo does not teach use of a second adjusted thickness limited as claimed.

As to claims 2-5, 7, 9-12, 30, and 32, they are allowable because they are directly or indirectly dependent upon claims with allowable subject matter above.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Timothy L. Rude whose telephone number is (571) 272-2301. The examiner can normally be reached on Monday through Thursday.


If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Frank Font can be reached on (571) 272-2415. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



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